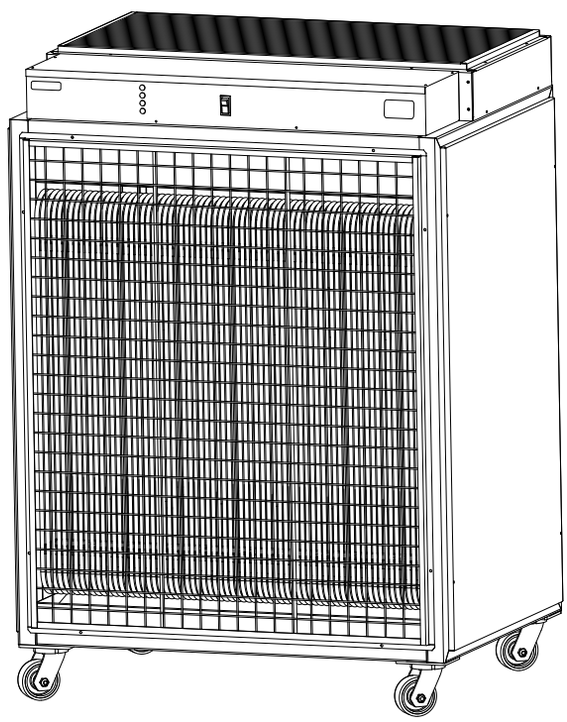
User manual

Dehumidifier
A 700VTI



INTRODUCTION

The A 700VTI is a dehumidifier intended for major industrial dehumidification, for example, for drying timber or other industrial drying processes. It can also be used to keep storage facilities dry. Its dimensions mean that it can efficiently dry around 15m³ of fresh timber (soft wood) sufficiently for shipping (18%). It can also dry 30-35m³ from around 20% down to 8% (carpentry dryness)

This instruction book provides a through description of how the dehumidifier is to be used and looked after, and how to carry out supervision.
This book also describes what action must be taken to ensure maximum safety, and how these safety details are formulated, as well as how they work.

IMPORTANT! The section on safety must be read and understood by everyone who is to use or repair the dehumidifier.

The instruction book covers the use and various maintenance procedures which can be carried out by the operator. More thorough servicing or error detection must be carried out by the manufacturer's service personnel.

The instruction book describes all the necessary safety details and must be read and understood by the user, before the dehumidifier is connected to an electricity supply. i.e. the first thing you must do is read this instruction book.

There are symbols and warning marks in this instruction book, and on the dehumidifier, which are shown on the next page.
If any warning label on the dehumidifier has been deformed or damaged, a new one must be ordered and affixed on the machine as soon as possible in order to ensure the greatest possible safety during the use of the dehumidifier.

The dehumidifier must only be used for the types of work which are described in these user instructions.

The manufacturer reserves the right to make alterations to these instructions.

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Please read through this instruction manual carefully and make sure you havefully understood its content before using the machine.

SAFETY INSTRUCTIONS

Warning marks

Read through this instruction book carefully and understand its contents before you use this dehumidifier.

Warning! This dehumidifier can become dangerous! Careless or incorrect usage may result in serious and even life-threatening injury.

Warning: high voltage is present if the cover is removed without the dehumidifier being disconnected from its power supply first.

The manufacturer's guarantee on this product fulfils the safety requirements of the low-voltage directive.

Warning and Important Note

In the text of these user instructions, the following boxes are in relevant places.

WARNING!
These boxes give warning of potential personal injury or damage to property. The warning boxes are placed in front of the procedure to which they refer.

IMPORTANT!
These warning boxes set out actions which facilitate a particular procedure, and any special instructions.

Safety while setting up the machine

Any fixed connection to an electricity supply and that of any peripheral equipment must be carried out by a qualified electrician.

Safety while using the machine

The dehumidifier's air intake and air outlet must never be covered during operation.

Protective covers and covering plates must never be removed during operation.

Safety during maintenance

Before any maintenance work is carried out on the dehumidifier, the machine should be disconnected from its power supply. This is done either by removing the plug from the power point or by shutting off the current using a circuit breaker.

All maintenance on the electrical system must be carried out by a qualified electrician.

All maintenance on the cooling system must be carried out by a qualified cooling installation engineer.

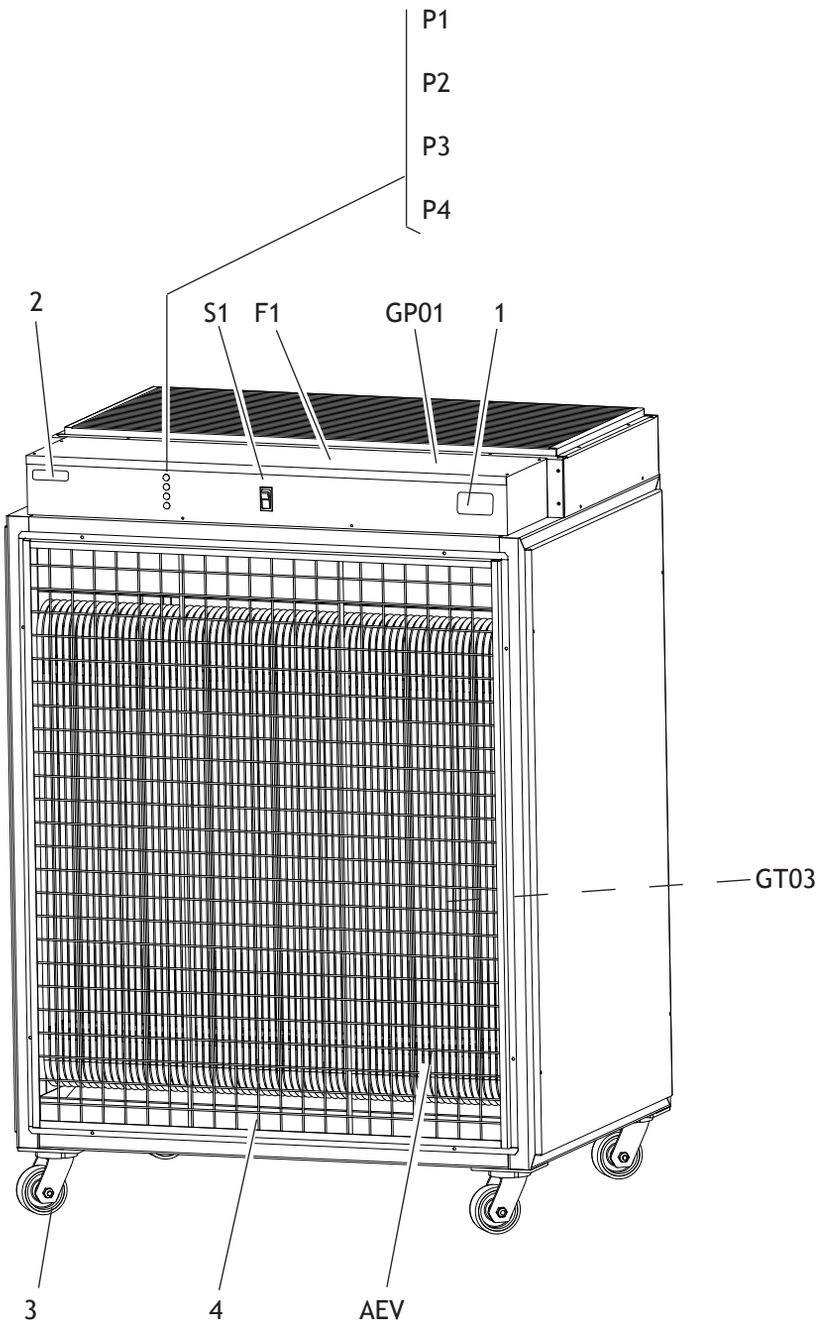
When cleaning the condenser, use gloves in order to avoid cuts.

TECHNICAL DATA

Technical data of the dehumidifier

Width:	1190 mm
Height:	1625 mm
Depth:	890 mm
Weight:	300 kg
Power supply:	3N~400V
Fuse:	25 A, slow blow
Rated power:	6800 W
Power consumption, compressor:	6000 W
Power consumption, fans (2 pcs):	800 W
Working range, temp:	+10 - +55°C
Working range, RH:	20-99%
Dehumidifying capacity:	max 30 l/h
Air flow, free blowing:	9000m3/h
Refrigerant, type:	R134a
Refrigerant, quantity:	9000g
Pressure switch setting, low pressure:	2,0 bar, diff=1,5 bar
Pressure switch setting, high pressure:	23 bar

DESCRIPTION



1	Label ”Warning 400 V”
2	Classification panel
3	Wheels
4	Water connection, R1”
AEV	Vaporiser
GP01	Manual reset for pressure switch high pressure contact. (in the electrical box)
GT03	Hot gas thermostat
P1	Operation warning lamp, green.
P2	High pressure warning lamp, red.
P2	Low pressure warning lamp, red.
P4	Hot gas thermostat trip warning lamp, red.
S1	Start/stop switch.
F1	Control fuse (in the electrical box)

Function

The A 700VTI is a condensing dehumidifier and is constructed on the principle that humidity in the air condenses on cold surfaces.
The cold surfaces are created on the vaporiser (AEV) by means of the compressor (M03) transferring heat from the vaporiser to the condenser (KD).
The dehumidifier is provided with two fans (M01 and M02) which transport the air through the dehumidifier.
First, the air passes the vaporiser (AEV), where the moisture condenses and is deposited on the vaporiser. The water is collected in a trough located under the vaporiser, and is then led away.
After this, the air passes the condenser (KD) and the fans (M01 and M02). In the condenser, the air is heated at the same time as the condenser is cooled down.

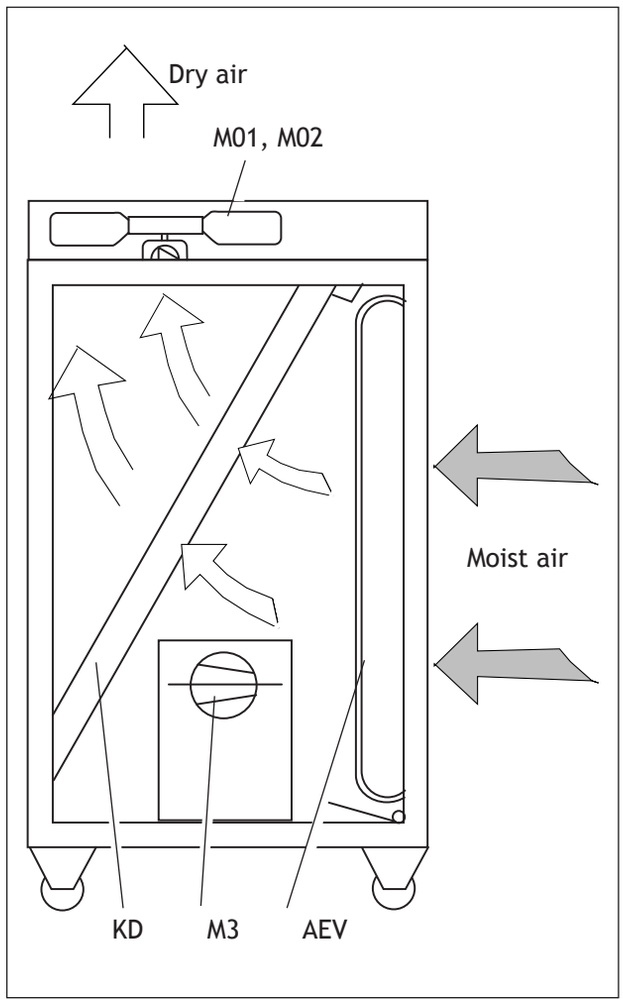
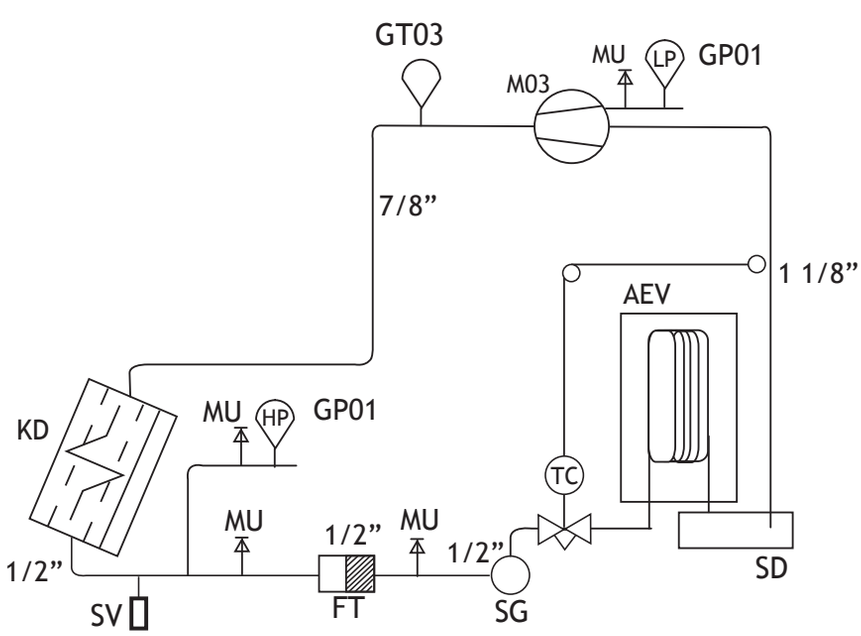


Diagram showing principles of movement

Components

AEV	Vaporiser
FT	Drying filter
GP01	Pressure switch
KD	Condenser
M03	Compressor
MU	Test point
SD	Regulator unit
SG	Inspection window
SV	Safety fuse
GT03	Hot gas monitor
TC	Expansion valve



Electrical system

Operation warning lamp (P1)

H1 is lit when the following conditions are met:
- The dehumidifier is powered.
- The phase sequence relay approves the connection.
- Any external control is shut off.

High pressure warning lamp (P2)

If it gets too hot during operation (maximum surrounding temperature 55°C), the pressure in the condenser rises and the high pressure contacts in the pressure switch (GP01) are triggered. The high pressure warning lamp (P2) lights up and the dehumidifier stops.
GP01 is reset manually using the reset button on the pressure switch.

Low pressure warning lamp (P3)

P3 is lit when the following conditions are met:
- The low pressure in the vaporiser is below the selected value.
  (2.0 bar, Δp=1.5 bar)
- S1 is in position ”1”.
- The phase sequence relay approves the connection.
- Any external control is shut off.

Hot gas thermostat warning lamp (P4)

(P4) flashes when the hot gas thermostat has been triggered. The dehumidifier’s built-in relay, K7, causes lamp P4 to flash for as long as the thermostat is triggered.
When the hot gas thermostat is reset, lamp P4 stays lit. Relay K6 is self-regulating and is reset by switching the dehumidifier off and on using S1.

On/Off switch (S1)

Control switch

Control fuse (F1)

The circuit breaker, F1, breaks the current at 6A and protects the dehumidifier’s control systems.

Hot gas monitor (GT03)

Protects the compressor from overheating.

Fans (M01 and M02)

Each of the fan motors are provided with a thermo-contact, GT01 and GT02. The thermo-contacts are inside the motor coils and break the current when the temperature is raised. The thermo-contacts are reset automatically when the temperature has decreased.

Time relay (K8)

The time relay, K8, is time-delayed and can be set to a value between 0 and 300 seconds. In order to avoid major instantaneous surges in current at the start of operation, where several dehumidifiers are being governed from the same starting point, the time relays on the different dehumidifiers are set for different times, e.g. 10 seconds apart.

When the A 700VTI is being used at lower surrounding temperatures, K8 is set to a start delay of 300 seconds, see page 9 under Pressure Switch (GP01), Industrial Dehumidifier.

Phase sequence relay (K4)

The phase sequence relay detects whether all phases arecorrectly connected, so that the motors turn in the right direction.
In the case of an incorrect connection, the phase sequence relay stops the supply of current to the dehumidifier’s control systems, and the machine cannot be started.

Pressure Switch (GP01)

GP01 is a double pressure switch for low and high pressure. The low pressure contact starts the compressor when the pressure in the vaporiser reaches 2.0 bar, and stops at 0.5 bar.
The high pressure contact stops the compressor when the temperature densor rises so that the pressure exceeds 23 bar. The high pressure contact is reset manually using GP01.

Industrial Dehumidifier

When using the A 700VTI at when the surrounding temperature, T_{surr}, is lower than around 25°C, it is necessary to optimise the defrosting cycle and operation by adjusting and adapting the low pressure values (Cut in, Cut out) in the double pressure switch GP01.
If no ice is being formed on the vaporiser, this is not necessary, and then the factory setting is recommended, Cut in = 2 bar and Cut out = 0.5 bar.
These settings are adjusted according to the surrounding temperature, T_{surr}, and are tested where the machine is currently operating.
In order to reduce the risk of an interruption in operation at surrounding temperatures under 25°C, T_{surr} should be constant.
See table 1 for the guideline value for the pressure switch's low pressure at different surrounding temperatures.
Please note that the table only specifies guideline values and may differ between machines and where the machines are currently being used.
The Cut in should not exceed 3 bar and the Cut out should not go below 0 bar. In order to ensure the smooth operation of the compressor, **the time relay, K8, is also adjusted to a start delay of 5 minutes**, see table 1.

T_{surr} [°C]	Cut in [bar]	Cut out [bar]	Tid på K8 [s]
10	1.2	0	300
11	1.3	0	300
12	1.4	0	300
13	1.4	0	300
14	1.5	0	300
15	1.6	0.1	300
16	1.7	0.2	300
17	1.8	0.3	300
18	1.9	0.4	300
19	2.0	0.5	300
20	2.1	0.5	300
21	2.3	0.5	300
22	2.4	0.5	300
23	2.5	0.5	300

Table 1
Guideline values for adjusting the pressure switch's low pressure values, Cut in and Cut out, during operation at surrounding temperatures, T_{surr}, lower than 25°C.
Please note that the table only specifies guideline values and may differ between machines and where the machines are currently being used.

External control

The dehumidifier is designed to be connected to various systems.

X1:24 & X1:25
External control (230V AC)
Enables external start (closed contact) and stop (open contact).
E.g. Hygrostat control
Looped on delivery.

X1:6 & X1:7
External control (230V AC)
Enables external control of the dehumidifier, with monitoring circuits in operation.
Looped on delivery.

X1:11 & X1:12
External control (230V AC)
Enables external control of electrical heating (accessory).
Looped on delivery.

X1:13 & X1:N
Control voltage (230V AC) for electrical heating (accessory).

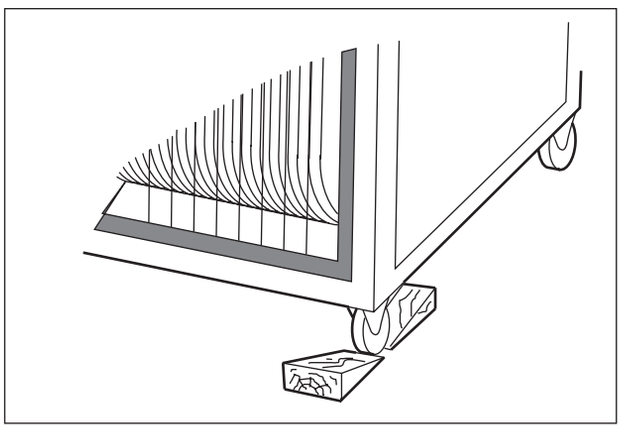
X1:20 & X1:21
External control (230V AC)
Enables external control of the compressor (only).
Looped on delivery.

Operational status (signal lamps P1 - P4) can be taken from plinths X1:31 (P1), X1:32 (P2), X1:33 (P3) and X1:34 (P4).

INSTALLATION

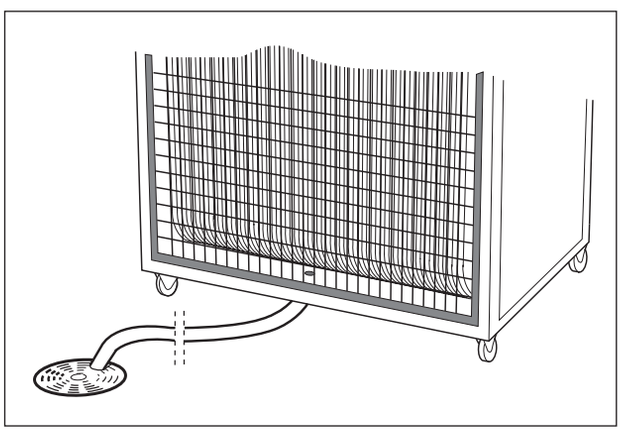
Set-up

The dehumidifier can be set up on a flat and stable surface.
After set-up, check the dehumidifier's wheels so that it is stable.



Water drainage

The dehumidifier is provided with an outlet for connection.
to a water drain. Connect the pipe (R1") so that it feeds down to a floor drain or similar.

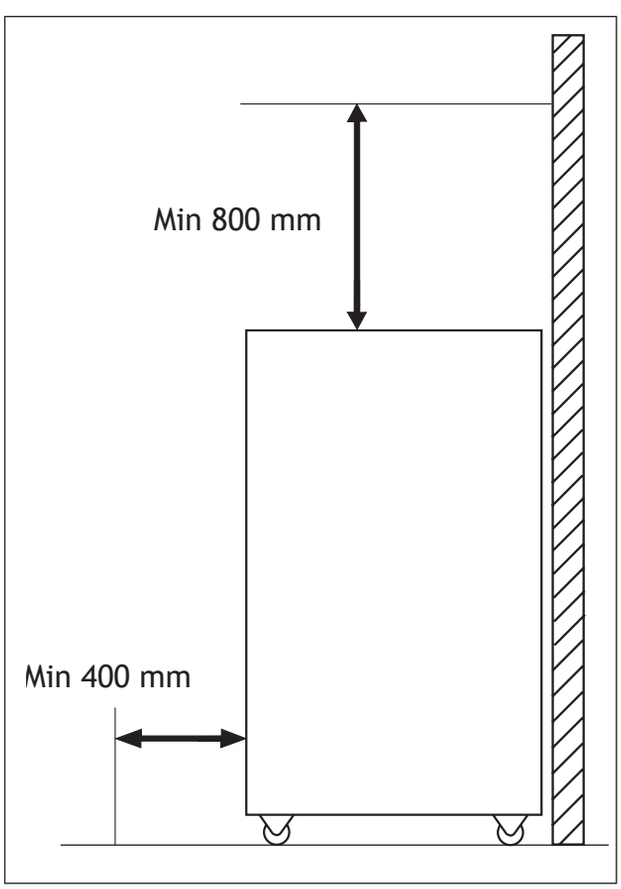


Air circulation

The appropriate place for the dehumidifier is with its back against a wall inside the drying area.
The free area in front must be a minimum of 400 mm.
The free area above must be a minimum of 800 mm.

External fans

If there are any other fans for air circulation in the drying area, these must not blow directly onto the dehumidifier's inlets or outlets.



Electrical supply

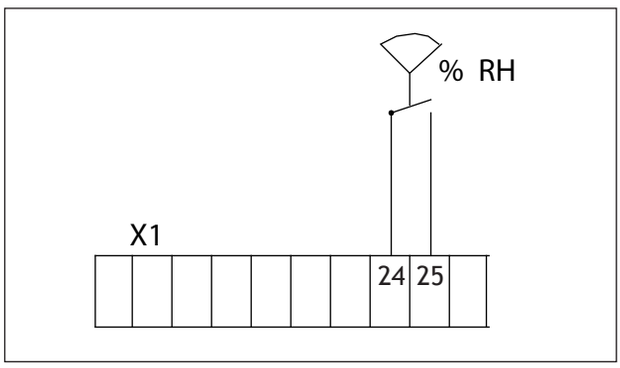
Connect the humidifier via a main switch to 3N~400 V and protective earth (PE). The mains shall be fused with 25 A slow blow fuse. Connect to terminal (X1). The phase-sequence relay (K4) is activated only if the dehumidifier is correct connected. If the dehumidifier will not start, switch two phases.

WARNING!
Electrical connection of the dehumidifier and its peripheral equipment must be carried out by a qualified electrician in accordance with national installation regulations.

Electrical connection

External humidistat (%RH) for automatic stopping
An external humidistat regulates compressor
Connect the humidistat to terminal 24 and 25.
The dehumidifier compressor is in operation with closed hudistat contacts.

See page 9 “external control” for more options.

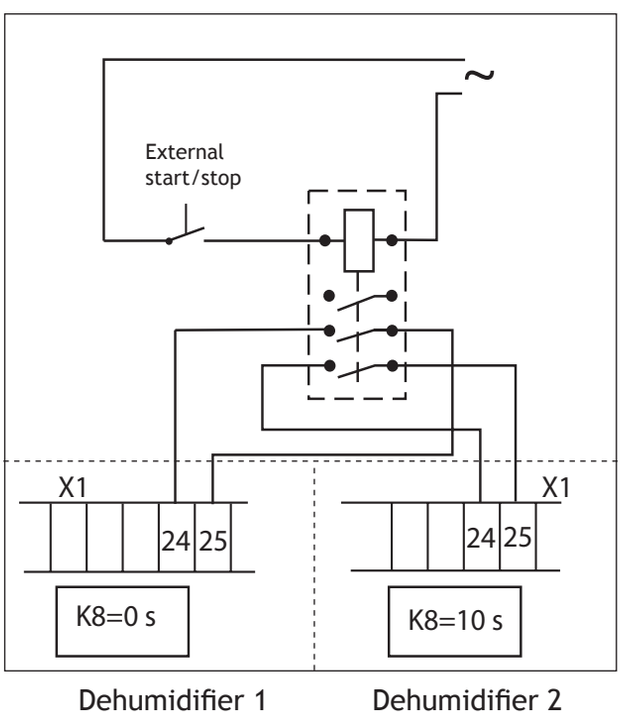


Simultaneous operation of several dehumidifiers

NOTE!
The figure to the right shows only parallel operation for two dehumidifiers.

To control several dehumidifiers at the same time the appropriate pair of terminals should be connected to an external contactor. The control coil of the contactor is to be connected to a external control (RC).

To avoid that all dehumidifiers start at the same time, the time relays (K8) shall be set at different times.
Set; the time relay in the 1:st dehumidifier to 0 sec.
the time relay in the 2:nd dehumidifier to 10 sec.
the time relay in the 3:rd dehumidifier to 20 sec.



DEHUMIDIFICATION

WARNING!
The dehumidifier's air intake and air outlet must never be covered during use. Protective covers and covering plates must never be removed during use.

The dehumidifier extracts moisture from the air at temperatures between +10 - +55 °C.
Connect the dehumidifier.
Start the dehumidifier with the start switch (S1).
The operation warning lamp P1 will light up.
Switch off the dehumidifier with the start/stop switch (S1).

IMPORTANT!
The maximum temperature allowed during dehumidification is 55°C. If the temperature rises higher than this, the high pressure protection system (GP1) is triggered.

High pressure trigger - P2 lights up

If the dehumidifier stops and the high pressure lamp (P2) lights up, the high pressure protection system on the pressure switch (GP01) has been triggered. Once the dehumidifier has cooled down (maximum surrounding temperature 55°C), the protection system is rest by pressing the reset button.

Low pressure trigger - P3 lights up

If the dehumidifier stops and the low pressure lamp, P3, lights up, either the surrounding temperature is too low, or the amount of cooling medium is too small - in the latter case, call the cooling technician.

Motor protection compressor trigger - P4 lights up/flashes

If the compressor stops, this means that the compressor is too hot. Lamp P4 flashes for as long as the compressor's built-in overheating protection system has been triggered.
Once the compressor has cooled down, the built-in protection is reset automatically and lamp P4 stays lit. After this, the dehumidifier can be reset using S1. (Alarm P4 is rest by switching the dehumidifier off and on again using S1)

The dehumidifier is completely deactivated - all lamps off

If none of the lamps are lit, and the dehumidifier is completely deactivated, despite being correctly connected to a power supply (including phase sequence), it means that the fuse (F1) has blown. Reset the fuse as follows:

1. Disconnect the dehumidifier's electrical connection. (plug or circuit breaker)
2. Unscrew the lid on the electrical box.
3. Identify and isolate the cause of fuse F1 tripping.
4. Reset the fuse (F1).
5. Replace the lid and start the dehumidifier.

Comments: The circulation fans have a built-in overheating protection system that resets itself.

Defrosting

At lower surrounding temperatures, where ice forms on the vaporiser, see page 9 under Pressure Switch (GP01), Industrial Dehumidifier.

MAINTENANCE

WARNING!
Before any maintenance work is carried out on the dehumidifier, the machine should be disconnected from its power supply.
This is done either by removing the plug out of its power point or by means of shutting off the current with the help of a circuit breaker.

All maintenance on the electrical system must be carried out by a qualified electrician.
All maintenance on the cooling system must be carried out by a qualified cooling installation engineer.

Every month

Check every month to see that the dehumidifier is clean inside.

WARNING!
Use gloves when working on the condenser. There is a danger of receiving cuts from the sharp grille slats.

Carry out the following actions whenever necessary:
- Clean the vaporiser cooling pipes with water.
- Blow-clean other equipment with compressed air.

IMPORTANT!
Never point the flow of compressed air directly towards the grille slats on the condenser. These can be damaged by a blast of compressed air.

Repairs

In the case of comprehensive repairs, contact your retailer.

During the guarantee period, the retailer must always be contacted before any repairs are carried out.

SPARE PARTS

When ordering spare parts, always quote:
- Type
- Serial Number

This information can be found on the top row of the dehumidifier's classification panel (see page 3)

Pos shows where the spare part is in the diagram.

Page(s) shows on what page(s) the diagram in question can be found.

Number shows how many units of the current spare part are to be found in the dehumidifier.

Pos	Page(s)	Name	Number	Catalogue No.:
1	5	Label ”Warning 400V”	1	KL604236
3	5	Wheels	4	KL504210
AEV	5,6	Dehumidifier package	1	KLA400665
F1	7,15	Fuse, Small circuit breaker B6A	1	2110106
FT	6	Drying filter	1	KL401330
GP01	6,7,16	Pressure switch, double	1	KL404015
GT03	6,7,12	Hot gas monitor	1	KL304240
P1	5,7,16	Warning lamp, green	1	KL302203
P2-4	5,7,16	Warning lamp, red	3	KL302202
K1	16	Connection box	1	3230604
Q2	15,16	Connection box	1	3233024
Q3	15,16	Connection box	1	3232174
K4	7,15,16	Phase sequence relay	1	KL301007
K5	16	Relay	1	4027857
K6	16	Time relay	1	4036440
K7	16	Time relay	1	KL301407
K8	16	Time relay	1	4079150
KD	6	Condenser	1	KL400570
M01-02	7,15	Fan	2	KL300004
M03	6,15,16	Compressor	1	KLA410300
SG	6	Inspection window	1	KLA402020

NOTES

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